MATH 310 Final (12.1 - 16.3) Review

1. Know the properties of vectors and ways of combining vectors: additon, scalar multiplication, dot product, cross product.

2. Know how to find the angle between two vectors and direction angles and direction cosines of an angle in space.

3. Know how to find equations of lines and planes in space.

4. Know the definition of cylinder and its graph in space.

5. Know the definition of quadric surface and equation, graphs of the six basic types.

6. Know how the definition of vector function and how to sketch the space curve.

7. Know find the derivative and integral of vector functions.

8. Know how to find the arc length and curvative of a curve.

9. Know how to determine velocity, acceleration and speed of an object in space.

10. Know how to find limits and determine continuity of functions of several variables.

11. Know how to find partial derivatives of functions of several variables.

12. Know how to find the equation of the tangent plane at a point and the linearization of a function at a point.

13. Know the chain rule.

14. Know how to find the gradient and directional derivatives

15. Know how to find the extreme values of functions over a region.

16. Know how to find the double integral over a rectangle and over a general region.

17. Know how to convert to and from polar coordinates.

18. Know how to find the moments and center of mass of a lamina and solids of variable density.

19. Know how to evaluate triple integrals and convert between rectangular, cylindrical and spherical coordinates.

20. Know convert a multiple integral using a change of variables.

21. Know the definition of vector field and how to sketch it.

22. Know the definition of and how to determine a conservative vector field.

23. Know how to find the line integral and the work done on a particle by a vector field.

24. Know the fundamental theorem for line integrals.

25. Know how to find the curl and divergence of a vector field.

Example exercises: Exam, Quiz & Homework questions;
Ch.12 Review, #1-77;
Ch.13 Review, #1-21;
Ch.14 Review, #1-63;
Ch.15 Review, #1-52;
Ch.16 Review, #1-14, 18-20